



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/666,188

09/10/2003

Jeffrey Wayne Eberhard

RD-28,444-2

8797

6147

7590

09/29/2004

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER

HO, ALLEN C

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,188

Applicant(s)

EBERHARD ET AL.

Examiner

Allen C. Ho

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 36-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Wofford *et al.* (U. S. Patent No. 6,260,999 B1).

With respect to claim 36, Wofford *et al.* disclosed a radiation imaging system comprising: a movable radiation source (15, 17); a radiation detector (24); a collimator (19) comprising adjustable geometry aperture assembly configured such that an adjustment of the aperture geometry is synchronized with the movement of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector.

With respect to claim 37, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Wofford *et al.* disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (3) for positioning the collimator.

With respect to claims 39 and 40, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (102a, 102b, 104).

With respect to claim 41, Wofford *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (102a, 102b, 104) with different boundary shapes (the aperture assembly has different boundary shapes depending on the positions of the positionable sections).

With respect to claim 42, Wofford *et al.* disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 43, Wofford *et al.* disclosed the imaging system of claim 39, wherein the plurality of sides comprise rotationally and translationally movable sides (Figs. 5A and 5B).

With respect to claim 44, Wofford *et al.* disclosed a method for radiation imaging, comprising: moving (3) a radiation source (15, 17) in a plurality of radiation source positions; adjusting an aperture (19) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (24).

3. Claims 36-42 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown *et al.* (U. S. Patent No. 5,751,781).

With respect to claim 36, Brown *et al.* disclosed a radiation imaging system (Figs. 10-12) comprising: a movable radiation source (**4a**, **4b**, **SO**); a radiation detector (**100**); a collimator (**4d**) comprising adjustable geometry aperture assembly (multi-leaf collimator) configured such that an adjustment of the aperture geometry is synchronized with the movement (rotation angle) of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector.

With respect to claim 37, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Brown *et al.* disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (**501**) for positioning the collimator.

With respect to claims 39 and 40, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (leaves in a multi-leaf collimator).

With respect to claim 41, Brown *et al.* disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (leaves in a multi-leaf collimator) with different boundary shapes (the aperture assembly has different boundary shapes depending on the positions of the positionable sections).

With respect to claim 42, Brown *et al.* disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 44, Brown *et al.* disclosed a method for radiation imaging, comprising: moving (502) a radiation source (4a, 4b, SO) in a plurality of radiation source positions; adjusting an aperture (4d) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (100).

4. Claims 36-42 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Liebetrueth (U. S. Patent No. 5,377,252).

With respect to claim 36, Liebetrueth disclosed a radiation imaging system comprising: a movable radiation source (4); a radiation detector (5); a collimator (6) comprising adjustable geometry aperture assembly (8) configured such that an adjustment of the aperture geometry (beam slice thickness) is synchronized with the movement (rotational angle) of the radiation source and coordinated with the radiation source position so as to limit the incident radiation to a predetermined exposure area at the detector (column 2, lines 52 - column 3, lines 19).

With respect to claim 37, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly is configured for adjusting at least one of the position of the aperture and the shape of the aperture.

With respect to claim 38, Liebetrueth disclosed the imaging system of claim 36, further comprising a collimator assembly comprising a collimator positioning apparatus (1) for positioning the collimator.

With respect to claims 39 and 40, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly comprises a plurality of movable sides (8).

With respect to claim 41, Liebetrueth disclosed the imaging system of claim 36, wherein the aperture assembly comprises multiple independently positionable sections (8) with different boundary shapes (the aperture assembly has different boundary shapes depending on the positions of the positionable sections).

With respect to claim 42, Liebetrueth disclosed the imaging system of claim 41, wherein the multiple sections have linear boundaries.

With respect to claim 44, Liebetrueth disclosed a method for radiation imaging, comprising: moving (1) a radiation source (4) in a plurality of radiation source positions; adjusting an aperture (8) by synchronizing the aperture geometry adjustment with the movement of the radiation source and coordinating at least one of the position and the shape of the aperture with the respective position of the radiation source such that a radiation beam emanating from the radiation source is collimated to limit the incident radiation to a predetermined exposure area; and detecting the radiation beam on a radiation detector (5).

Response to Arguments

5. Applicant's arguments filed 12 July 2004 have been fully considered but they are not persuasive.

Applicants argue that Wofford *et al.* and Brown *et al.* failed to teach an adjustable geometry aperture assembly configured such that an adjustment of the aperture geometry is synchronized with the movement of the radiation source. The examiner respectfully disagrees. Wofford *et al.* and Brown *et al.* disclosed radiation therapy treatment apparatuses that comprise a radiation source rotating about a patient to provide therapeutic radiation. As is well known in the field of radiation treatment, the radiation beam is modulated by an adjustable collimator as the radiation source rotates around the patient because the beam profile is different at each angular position of the radiation source. Thus, the geometry of the collimator is synchronized with the movement (rotation) of the radiation source. Accordingly, the rejections are maintained.

Applicants argue that Liebetrueth similarly failed to teach that the aperture geometry is synchronized with the movement of the radiation source. Again, the examiner disagrees. Liebetrueth clearly taught that the aperture geometry (size of the aperture, which defines the slice thickness) is synchronized with the movement (rotation) of the radiation source (column 2, lines 52 - column 3, lines 19). Accordingly, the rejection is maintained.

6. Applicant's arguments filed 12 July 2004 with respect to the drawings have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

7. Applicant's arguments filed 12 July 2004 with respect to the specification have been fully considered and are persuasive. The objection of the specification has been withdrawn.

8. Applicant's arguments filed 12 July 2004 with respect to claims 36 and 37 have been fully considered and are persuasive. The objection of claims 36 and 37 has been withdrawn.

Art Unit: 2882

9. Applicant's arguments filed 12 July 2004 with respect to claim 43 have been fully considered and are persuasive. The rejection of claim 43 under 35 U.S.C. § 112 first paragraph has been withdrawn.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink that reads "Allen C. Ho". The signature is written in a cursive, flowing style.

Allen C. Ho
Patent Examiner
Art Unit 2882

22 September 2004